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ABSTRACT

On June 7, 1993 the Commission on Preservation and Access convened an international group of scholars, librarians, archivists, and information scientists to explore opportunities for international collaboration in saving the contents of libraries from loss through the embrittlement of the pages of their books. This conference was intended to increase awareness and concern about the problem of decaying library collections, to begin to build a European-centered effort, and to enlarge and solidify the cooperation between Europe and the United States. The conference began with a summary of preservation efforts so far, considering issues such as what to save and how to save it. The 23 conferees recognized the importance of raising the level of awareness about decaying books. It is important not to delay preservation efforts while waiting for a particular method to prove itself optimal. The most flexible, dependable, and economic efforts should be used at once, while trials of alternatives proceed. Recommendations of the conference create an ad hoc steering committee for initiating and supervising the process of constituting a European commission on preservation and access. An ad hoc committee was formed to begin this effort. The full text of the resolution and recommendations adopted by the conference are included in an appendix. (SLD)

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ED 364 258

The Commission on
Preservation & Access

Preserving The Intellectual Heritage

A Report of The Bellagio Conference
June 7 – 10, 1993

Held at the Rockefeller Foundation
Study and Conference Center in Bellagio, Italy

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PREFACE

Knut Kleve, Professor of Classics at the University of Oslo, is a papyrologist who attended the Bellagio conference. He prepared a delightful essay that puts our current consensus for preservation into a truly long-range perspective. The essay has been slightly condensed and makes a splendid introduction to this report.

— Patricia Battin

Papyrus was the writing material of the Egyptians, Greeks and Romans, and papyrus rolls the brittle books of antiquity. Lucretius and other authors tell how the rolls crunch and go to pieces in use, and these accounts are confirmed by modern discoveries of papyri under the lava of Herculaneum and the sands of Egypt. Papyri had other deficiencies. One could write only on the inside of the roll, for the outside was too liable to damage when unrolled. A roll could not be too long, lest it become unmanageable. Most of the Greek and Latin rolls that are preserved are less than ten meters long. For that reason, a roll did not contain much text, and major works, such as Homer's *Iliad*, had to be divided among several rolls. It was, furthermore, difficult to look up a particular place in a papyrus roll. The text columns were unnumbered and you had to roll up until you found the place you were searching for. Therefore, current authors were likely to cite from memory — and erroneously.

Parchment was occasionally used from the second century B.C. and it eventually became the material of the future, while papyrus gradually fell out of use. Parchment held sway, in turn, until it was replaced by Arabic paper. Here we have the three p's of cultural history: papyrus, parchment and paper. Now we seem to have a fourth: the PC.

Parchment was a tougher material than papyrus and could easily be bound into codices (i.e., our form of books). One could write on both sides of the parchment and one codex could contain the content of many papyrus books, say, the whole of the *Iliad*. A numbering system was introduced for the pages (or the chapters and verses) in the text, especially for the Holy Scripture where it was important to find the right quotation.

The fourth century was a critical time for the classical literature of Greece and Rome. Written on papyrus, it was gradually crumbling away and threatened to sink into oblivion unless transferred to parchment. Constantine the Great had begun that process by having the books of Holy Scripture copied, and his son the Emperor Constantius II undertook to continue the effort. The result of his initiative was the first imperial library of Constantinople, which contained more than 100,000 volumes. The leader of the project was Themistios who commanded a considerable team of calligraphers and librarians.

One of the main problems was, as it is today, to choose what to save, for it was impossible to save everything. First, Themistios and the emperor chose to save the old literature —Homer and other great authors of the golden age of Greece. Themistios seems to have been uninterested in Latin authors. He did not, and did not want to, understand Latin. He was an arrogant Greek who regarded all other people, including Romans, as simply barbarians. But the emperors were Romans and Latin speaking, so Constantius saw that the classical literature was also transferred to parchment.

Although the older literature was regarded as more valuable than contemporary work, no one any longer spoke the Greek of the great Attic authors. So it was necessary to save commentaries and works of grammar as well as the texts of Sophocles, Plautus and other classical works. From the record, we can see that Themistios knew many more classical authors than we have today. For instance, he mentions a triad of Stoic philosophers whose work is completely lost to us except for a few citations by other classical authors and some scraps among the carbonized remains at Herculaneum.

Themistios also had a remedy for the papyrus rolls that could not possibly be transcribed. He tried to delay the decay by putting the rolls into parchment coverings, rather like our attempt to encase brittle books in special envelopes or boxes.

The greatest enemy of ancient literature was, however, fires. Several fires in the Constantinople library eventually destroyed much of the collection, but Themistios' efforts had not been wholly in vain, for visitors came to the library from the provinces to consult works and take away copies — and some of the copies were recopied. Without the efforts of Constantius and Themistios our knowledge of the classical literature would certainly have been even smaller.

Certainly some of the lost literature was deliberately and systematically destroyed. A quite unhistorical, but probably apt, story comes to us through the Norwegian humorist, Nils Kjaer. At the time of Caliph Omar's invasion of Egypt, the Arab officer on duty in the destruction of the library of Alexandria used two stamps with which he marked the books. One said: "Does **not** agree with the Koran — heretic, must be burned. The other said: "Agrees with the Koran — superfluous, must be burned."

I. INTRODUCTION AND SUMMARY

On June 7, 1993, the Commission on Preservation and Access convened an international group of scholars, librarians, archivists and information scientists at the Rockefeller Foundation Study Center in Bellagio, Italy, to explore opportunities for international collaboration in saving the contents of libraries from loss through the embrittlement of the pages of their books. This conference, *Preserving the Intellectual Heritage*, had three principal objectives:

- to increase awareness and concern about the problem of decaying library collections, especially among European scholars;
- to begin to build a European-centered effort that can effectively collaborate with scholars and libraries in the United States, while still addressing preservation issues that may be unique to some of the European countries; and
- to enlarge and begin to solidify the scholarly linkages between Europe and the United States in all fields that depend on the endangered literature on both continents.

Preserving the Intellectual Heritage was organized by the Commission on Preservation and Access and supported by the Rockefeller Foundation and the Andrew W. Mellon Foundation. The 23 participants, whose names and brief biographical information appear in the Appendix of this report, came from eleven countries of Western Europe and the United States. None were official delegates of their nations or of the professional organizations to which they belong. They were chosen to provide the widest possible range of scholarly, national, and technical interests consonant with the purposes of the meeting and the capacity of the conference facilities. They were invited to participate because of their interest in preservation issues in their particular countries as well as a desirable degree of prominence and influence there.

The decision to center the objectives and the agenda of the conference on Western Europe and the United States was motivated by several factors: the overlap in the scholarly contents of western European and North American libraries; the comparatively good physical condition of many of the books in western European collections, as well as the active interest of these countries in preservation; and, finally, the effective linkage of the Commission's International Project with the European

adoption of a common bibliographic record for preserved materials that is compatible with U.S. practice. These several conditions seemed to bode well for the Commission's announced goal for the conference, namely that it would be considered to have been successful ". . . if it develops a framework for productive contributions to a multi-national, collaborative, European organization or consortium that serves international as well as national needs, and is capable of working with parallel groups in the United States to divide responsibilities for the preservation and exchange of preserved materials with North America." Such an ambition, the Commission also noted, need not be limited to western Europe and the United States but, indeed, should be thought of as expandable to the rest of the world.

The conference began with a review of both the U.S. and the European efforts so far to preserve the intellectual heritage. Several participants were asked to prepare papers that could be circulated in advance. Other participants had been invited to make informal comments from their personal and professional vantage points. All of these contributions are paraphrased or summarized at appropriate points in Section II of this report, Record of the Conference.

United States and European Experience With Preservation

United States participants reported on extensive programs of reformatting[1] (substitution) on a mass production scale to capture as much of the intellectual content as possible of the estimated ten million unique titles that are in danger of loss through decay of acidic paper. Though archives, audiovisual and other collections are also endangered, the Commission on Preservation and Access decided to begin with books as the most tractable part of the problem. The size of the problem, together with the time and funds available, make the task of selection essential. Not all books can be saved. Scholars are the principal users of most of the endangered material and should be involved, along with librarians, in designing the selection strategy and setting priorities. Extensive publicity and educational efforts have been successful in persuading the U.S. Congress to expand an ongoing preservation program at the National Endowment for the Humanities (NEH), and private foundation funding has helped the Commission on Preservation and Access establish scholarly committees on selection as well as to pursue a pro-

[1] Reformatting has been the American term for copying to a different medium. The corresponding European term "substitution" may be more felicitous.

gram of research and development in methods of preservation. The Commission's strategy has been to explore convertibility among media: print on paper, film and digital electronic. The huge potential of the latter, as well as the current obstacles to its widespread and routine use, were explained.

Discussion of the U.S. experience revolved around alternative technologies, and the necessity and difficulty of making choices of what to save. While many scholars are reluctant to let anything be lost, some archivists keep only a small fraction of what they receive, and most librarians recognize that all collections are necessarily incomplete. The problem of criteria for selection is unavoidably complex and controversial.

The experience of four western European countries reveals a great deal of variation in both the level and type of preservation activities. Some countries have well-developed programs involving collaboration among institutions; others have well-articulated national plans that are yet to be implemented; and some have just begun to study their preservation problems. Many European scholars, like their U.S. counterparts, seem to be unaware of the deterioration in library collections (or unconcerned about it). That is true of the public at large as well, and governmental bodies generally are not well informed about the problem. Still, where concerted efforts have been made to enlist public support for preservation, they have been successful.

Several countries have chosen to select materials for preservation on the basis of their relevance to the national cultural heritage. So far there has been relatively little international collaboration, although efforts are underway to develop a register of microform masters and to record the existence of preserved materials in a common bibliographic format.

Microfilm is widely used for capture and storage of book contents, but Switzerland has tested several systems for mass deacidification and Germany is building a deacidification plant. None of the countries present has had substantial experience with digital electronic methods, but there is much interest in this technology.

The extent and nature of deterioration in European libraries parallel the North American experience. The pages of pre-1800 books are in fairly good condition, while covers and bindings have been badly damaged by heavy use and poor storage conditions. Later publications

have decaying acidic pages as well. The proportion of endangered material in collections varies both within and between countries. Estimates are often based on slight or unreliable evidence, but the inevitable conclusion is that the problem is enormous, structural in character, and requires both a national and an international approach. Without doubt, millions of books are endangered and millions of dollars will be required to save even a portion of Europe's cultural heritage.

Exploring Emergent Issues

The conferees recognized the importance of raising the level of awareness about decaying books among scholars, librarians, university officers, cultural ministers, publishers, private foundations, professional societies and parliaments. The weight of opinion sided with the view that scholars had to be involved in developing the strategies of selection and in assigning priorities, even though it may be difficult for scholars to agree on what is most important. Even a chaotic, conflictful debate, however, could be informative and productive. At a minimum scholars must take responsibility for developing a personal, informed interest in preservation and for "carrying the message of preservation into the chambers of power."

The conferees did not take a position on which methods of preservation were to be preferred, but there was no dissent from the view expressed that it was important not to delay preserving materials until a particular method has been proved optimal. Instead, the most flexible, dependable and economical methods should be used at once, while experiments and trials of alternatives proceed. In the end it might well turn out that different methods would be suitable for different materials. The important aspect of the choice of method is to insure the maximum convertibility from the contemporary capture and storage method to the improved techniques expected in the future.

The conferees discussed strategies for enhancing both inter-European and transatlantic cooperation for dealing with preservation problems. Extensive exploration of alternatives for organization, membership, sponsorship and mission led to the conclusion that a European counterpart of the Commission on Preservation and Access should be formed, and that the initiative should come from the persons present at the conference.

The recommendations of the conference, approved unanimously, create an ad hoc steering committee that is responsible for initiating

and supervising the process of constituting a European commission on preservation and access. The general nature of such a commission is sketched out, and the steps to be taken by the ad hoc committee are prescribed: first, to enlarge its membership by inviting some persons not present at Bellagio to join it; next, to take steps for nominating and electing members to form the board of the European commission; and finally, in concert with the board, to proceed with the formal and legal establishment of the organization.

Having approved the recommendation to establish the ad hoc committee, the European representatives then elected Pieter Drenth, Michel Jouve and Geoffrey Martin as its members with Alison de Puymège as secretariat ad interim. The ad hoc committee was encouraged to move quickly to take the first step and to complete the expansion of its membership to six persons by July 20, 1993.

The full text of the resolution and recommendations adopted by the conferees is presented in Section III.

II. RECORD OF THE CONFERENCE

This record is a distillation of the sense of the meeting, which encompassed a variety of views as well as significant common ground. It is not a formal position of the Commission on Preservation and Access or any other organization.

The general plan of the Bellagio meeting was to begin by exploring how the various issues of preservation had manifested themselves in the United States and the several European countries. It seemed important to outline the problem of brittle books, the measures taken to estimate its size, to find or create organizations for processing material to be preserved, to raise awareness of the problem and to secure funds for these tasks. The experience of various countries with different technologies of preservation also had to be reviewed, while the critical issues of how to select the books to be saved needed to be explored. This range of discussion was necessary to provide a common ground on which it might be possible to take specific steps toward the goal of the meeting: to begin to build a European-centered effort that can effectively collaborate with scholars and libraries in the United States while still addressing preservation issues that may be unique to some of the participating European countries.

The U.S. Experience

Several conference participants gave brief reports on preservation needs and activities in the United States. These were not systematic surveys, but the observations of scholars, librarians and technical specialists who were in a position to have a good overview of the situation.

For many years librarians and scholars had noticed that the pages of some of the books in their libraries were turning brown and becoming brittle, but the magnitude of the problem and its cause were not fully appreciated until the mid-1980s. Several assessments of the extent and seriousness of deterioration eventuated in the creation of the Commission on Preservation and Access to serve as an advocate for public and private development of a coherent national plan to save the intellectual legacy threatened by acidic paper embrittlement. The Commission's strategic approach gave a high priority to capturing the contents of three million brittle books over 20 years, through a cooperative U.S.-wide microfilming effort that was named the Brittle Books

Program. This strategy of reformatting is but one component of a broadly conceived preservation plan to save published and documentary knowledge recorded in any format. The plan includes newspapers, special collections of manuscripts and archives, mass deacidification, the conservation of selected artifacts and encouragement of publishers to use acid-free paper, as well as training for preservation personnel, state and regional consultation services, professional conferences and research and development activities. The microfilming component of the plan explicitly includes provision for access — that is, for storing the preserved material in a safe place and making copies available to anyone for a fee that covers costs. This feature — wide and easy access — was an important factor in justifying federal governmental support of the Brittle Books Program. In 1988, the National Endowment for the Humanities (NEH), a federal government agency, was authorized to strengthen an existing preservation program that has, each year since then, been funded at between 12 and 17 million dollars. The money provided by Congress to carry out the U.S. national preservation plan is administered through the NEH, which receives and reviews with the aid of scholars and other experts proposals from individual libraries or consortia of libraries that hold the books to be saved.

Though it was a landmark, this federal action was not the start of preservation of endangered material in the U.S. More than 20 years earlier, both university and national libraries had begun to struggle with the problem but had made little progress on an overwhelming problem because of inadequate resources. Surveys of library collections had shown that 80 percent of the books in research collections were printed on acidic paper, and that 30 percent of the volumes were already embrittled beyond redemption by deacidification or paper strengthening processes. The magnitude of deterioration made it clear that there was neither time nor money enough to save all of the embrittled material: choices had to be made.

There is little dependable evidence on the amount of overlap among the collections of major research libraries in the U.S. The best available estimate is that approximately 80 million volumes in these libraries are embrittled, and about ten million of these are unique. The objective of the Brittle Books Program is to preserve one-third of this ten million. In order to eliminate duplication of effort at different libraries and to ensure convenient retrieval of preserved material, the program has developed a simple, standardized on-line capacity to indicate intent and commitment to film and the existence of a master copy. There is also

agreement among participating libraries on technical standards for microfilm and on minimum standards for bibliographic control.

At the time the NEH program was being proposed to the Congress, preservation microfilming was being carried out as a cottage industry with a series of small shops in a few university libraries, and by a few commercial publishers. The costly standards for archival filming and the limited market for infrequently used research materials had discouraged the development of any significant preservation filming capacity in the for-profit sector.

Given the size of the task, it was necessary to move beyond the cottage industry and develop a nonprofit agency that could capitalize on the economies of scale afforded by a centralized production facility. With the aid of private foundation funds, the first such facility, MAPS The MicrogrAphic Preservation Service, was established in the northeast region. It rapidly grew into a national facility as institutions realized that transporting books to a central location was more efficient than enlarging local facilities or creating new ones in every library. Furthermore, when it became apparent that substantial funds would be available on a continuing basis from the federal government, two major micropublishing companies with years of experience in high-quality microfilming established preservation filming divisions. These three facilities — two commercial, one non-profit — provide a substantial portion of the necessary capacity for the U.S. 20-year plan.

The Commission never considered microfilm to be the preferable medium for use or dissemination, but only as the most dependable, widely understood and proven technique for a holding action until superior technology could replace it. The largest part of the cost of reformatting is the selection, transportation, preparation and handling of books for copying by whatever means. These factors suggested continuing to use film for storage until alternative technologies became economically competitive and yielded a product of at least equal quality in a mass-production mode.

The Commission has sponsored a number of research and development projects to explore convertibility between paper and film on the one hand and electronic media on the other. Experiments underway or completed have demonstrated the feasibility of scanning a book directly to produce a digital electronic copy, or scanning microfilm for the same purpose. Demonstrations have also shown that the digital copy can drive a high-speed printing process that produces a facsimile of the

original (paper) book, and the digital copy can also be transmitted over networks to remote users. Producing microfilm for long-lasting storage from a digital copy also seems feasible.

Digital technologies have significantly greater reliability of reproduction and ease of transmission, and they promise vast enhancement of access. Still, there are technical obstacles to overcome before a major shift from film to digital media can occur. Briefly, there are three principal challenges: improving the quality (resolution) of the scanned electronic product currently available to the user; storing the scanned material in a form that will be accessible hundreds of years from now; and putting into place distribution systems to provide access at any distance.

One obstacle (that will disappear as technology advances) is that books can be scanned at a much higher resolution than can be reproduced on the computer screens in common use today. Even finer resolution lies ahead. Higher resolution in scanning costs a bit more but is judged as worth it, since it will ultimately enable higher quality resolutions for use. Furthermore, since the chief cost of conversion from paper to digital is the labor of handling the book, a governing axiom for preservation is to scan at the highest level possible, so that it will not be necessary to copy a book — in any medium — more than once.

Ensuring longevity poses different problems. Electronic technologies change rapidly and images stored in digital form today may not be accessible even five years from now. Rather than a property of the medium, longevity becomes a matter of keeping up with changing hardware and software through periodic "refreshing", or copying to new equipment. Longevity will depend upon institutionalizing a process of inventory management designed to insure that preserved materials are always stored in ways that current technology can retrieve.

Providing worldwide access depends on putting the necessary infrastructure in place and standardizing its usage. There is much to be learned about the best ways to store, share, index and access digital information over networks. It is essential to agree on standard ways of exchanging information over networks. The complex issues surrounding control of intellectual property and fair treatment of copyright holders as well as users need attention.

Progress is being made in all these areas, but preservation technology is still in transition, and microfilm's stable and standardized prop-

erties, together with its convertibility to other media, recommend its continued use.

It should not be necessary to use a single medium for every function. Instead, one might, for example, choose microfilm for archival storage of little used materials, but then convert the information to electronic form for dissemination and for printed copies on demand. Alternatively, one might create microfilm from electronically scanned materials because microfilm storage is cheaper, more standardized and longer-lived. For the time being, a mixed and flexible technological strategy seems optimum.

The Commission has appointed a series of scholarly advisory committees, which include some librarians and archivists, to offer guidance on selection for preservation in such fields as art history, literature, philosophy, and medieval studies, on the theory that various fields of learning may have different needs and, hence, different strategies may be appropriate. While these committees have not fully solved the selection question, the various fields have chosen different types of material as most important for preservation. The experience of these committees has been instructive: they have made slow progress because of the inherent difficulty of the task, but also because they have had to work through their resistance to the very idea of making choices, to acknowledging that not everything can be saved, and recognizing that delaying the choices would only insure a larger (and more random) loss.

The lessons that the Commission has learned from its efforts may have some relevance to the European situation: cooperation among autonomous and historically proud libraries is both essential and difficult Long-term goals and long-term vision are necessary. The incredible force of custom and tradition can make scholars and librarians resist microfilm as a means of access and impel them to try to keep fragile books on the shelves and in circulation. These old habits persist despite mounting evidence that scholars are demanding increased access while suffering from decreased ability to travel to collection sites and space limitations are increasingly acute in libraries. The Commission's governing strategy rests on three principles: separate the tractable from the intractable; encourage cooperation and sharing responsibility; and ensure broad access to preserved material.

Discussion of the U.S. Experience

The Brittle Books Program is an example of dealing with the tractable. It focuses on books for a variety of reasons: there was already in progress a national program to microfilm newspapers; the bibliographic records available for books make it easier to locate material for filming and to avoid redundant effort. Other media — e.g., archives, audiovisual records —present even greater difficulty in preservation technology and perhaps in selection and bibliographic control as well.

While the need to save the intellectual content of a valuable book is clearly paramount, some scholars make strong arguments for the conservation of the actual publication, the object itself. At present this goal cannot be accomplished on any large scale, but perhaps there is a small set of objects in each discipline that can be conserved by some form of stabilization to avoid further decay. Or, perhaps a "one best remaining copy" of a particularly important work could be selected for conservation.

The idea of conserving one best remaining copy raises at least two questions: how would such choices be made? and what might induce holding libraries to contribute their arguably rarest and most precious possessions to the set? In some European countries the choice might become entangled in political issues among ministries and universities. Furthermore, some American libraries whose special collections have been relatively protected by favorable climatic conditions even now resist filming and might be unwilling to contribute a last surviving title to such a set.

Because the use of print and photograph collections is increasing substantially in many libraries, the policy of unlimited access to the originals has caused severe deterioration. Electronic scanning of images could offer an alternative route of access: a low-resolution image is useful as a reference tool to identify those items which need to be closely examined. The image can be allowed to be "just fuzzy enough" to permit the viewer to evaluate it and decide whether to obtain a higher-resolution copy such as a photograph, or to request the original, deacidified and protectively stored, for essential scholarly use. The "fuzzy browsing" of a collection of images could be very useful to scholars.

The necessity for choice, for consciously letting go of some books and saving others, is not seen as a major problem by governmental archivists who routinely destroy material they consider of little value.

One estimate is that archivists retain only about one percent of what they receive. Scholars are probably unaware of how much is currently being lost, but many are anguished by the loss of even one book and find choice a difficult intellectual challenge. It is the view of some archivists that scholars should not be involved in selection because they cannot make the necessary choices: they are often too parochially concerned with their own discipline and, even there, have difficulty reaching consensus.

The European Experience

Conference participants from four countries of western Europe were asked to provide background papers on conditions in their homelands to stimulate broader discussion among all the countries represented. These reports were not systematic surveys, but rather the observations of scholars, librarians and archivists who were in a position to have an overview of the situation.

Germany

In Germany, about 15 to 30 percent of the books in research libraries (30 to 60 million volumes) are threatened with deterioration due to acid paper. In the last four to five years governmental committees and national associations have been paying attention to the situation and The Library Commission of the German Research Council has begun a study of preservation problems. Nonetheless, a majority of scholars, as well as the general public, are not aware of the problems of paper deterioration. Teachers, students, other users of libraries, and even librarians themselves do not always understand that collections are turning to dust.

While there is agreement on the need for book preservation among those who are aware of the problem, they recognize that not all endangered books can be saved, and that the best methods for accomplishing the purpose are not yet clear. Currently, microfilm and microfiche are most used. There are, however, great expectations for mass preservation through deacidification. A large deacidification plant that does not use fluorocarbons has been built for the German National Library at Leipzig and should be in operation by the end of 1993. If it is successful, several such plants are proposed to serve various regions of Germany. So far there has been little use of electronic technology for capturing and storing the contents of brittle books. Rapid changes in hardware and software, as well as the incompatibility of different storage

systems, shorten the useful life of electronic storage to less than that of conventional books. The need for internationally connected data banks is clear and the efforts of the European Register of Microfilm Masters (EROMM) are supported by the corresponding German register (GEROMM).

Criteria for the selection of items to be preserved are still not fixed, and are controversial. Discussion about criteria for selecting books to preserve should remain open, never ending, pluralistic, even chaotic — not unsystematic or unstructured, but productive and fruitful. Such discussion should not be limited to scholars nor even dominated by them. All interested parties should be involved but especially librarians and archivists whom scholars have reason to trust. It could be unreasonable to build collections or to preserve books exclusively according to the wishes of scholars.

The German Research Council (Deutsche Forschungsgemeinschaft) provides financial support for the preservation of newspapers, journals, yearbooks, parts of special collections, and central disciplinary libraries. On the other hand, one cannot be optimistic about obtaining governmental support for large-scale programs of the sort needed. Ministerial proposals for funding preservation have so far been pitifully inadequate. The current financial situation of the German federal and provincial governments precludes any vision of a society preserving the entire intellectual heritage.

Switzerland

An important project on mass deacidification is being conducted jointly by the Swiss Federal Archives and the Swiss National Library (BAR/SLB). It is one initiative in an overall preservation plan that includes improving environmental conditions of storage, research on paper conservation and restoration of individual items of special value. The deacidification project sought a single system that would be able to accommodate large quantities of archival and library material without prior selection and would leave an adequate alkaline reserve in the paper. Needless to say, a satisfactory system would not damage the material being deacidified or be dangerous to handle. A request for proposals brought forth five processes: Wei T'o, Booksaver, Battelle, FMC/Lithco, and Akzo/DEZ.

Two systems seemed promising enough to deserve testing. Lithco (a liquid treatment) and DEZ (gas) were put through a series of

tests in the fall of 1991, with rather disappointing results. The Lithco process originally employed fluorocarbons as a propellant, but had to find a substitute since those compounds had been banned by a recent Swiss law. The substituted chemical apparently was responsible for unsatisfactory results, including incomplete treatment, "intolerable damage of the material (leaching inks, staining paper)" and strong odor. The extent of such damages led to the conclusion by BAR/SLB that the Lithco system — as it had been proposed and tested — had little chance to be improved. The vapor deacidification process of DEZ also had deficiencies including insufficient homogeneity of treatment, iridescent spots and odor. Damage to the material was less severe and the chances for improvement of the DEZ process were estimated as much higher. All the tests had shown that deacidification and buffering extended the life of paper, which encouraged BAR/SLB to proceed with further evaluation.

In the spring of 1992, BAR/SLB began a cooperative test program with the U.S. Library of Congress (LC). The single test run that has been completed so far showed no significant improvement in the DEZ system. BAR/SLB are still convinced of the possibility of mass deacidification, but experience to date has shown very clearly that even the most advanced systems still need a lot of development.

Perhaps the initial ambition to test all material through one system of deacidification without prior selection is unrealistic. Nevertheless, the exploration of deacidification systems and their evaluation will continue in the hope that it can take its place in the armamentarium of preservation along with microfilm, digitization, and environmental control.

England

Oxford University recently conducted a survey of the condition of collections at its 122 libraries and archives. The data have not been fully analyzed, so only tentative conclusions can be reported. Chief among these is that the greatest amount of damage in the collections is to the bindings. More than a quarter of a million volumes (out of a total of 9.7 million) are estimated to show major structural damage, while nearly three-quarters of a million show minor structural damage — due principally to heavy use and frequent handling. There appears to have been a substantial increase in the research use of the collections in recent decades. There is also heavy structural damage in the maps collections, in prints and drawings, and especially in the manuscripts collections where unbound modern materials are very vulnerable. Rather sur-

prising, however, is the tentative finding that brittle paper was encountered in less than five percent of a small sample of books (compared to 17 percent found in a survey of the British Library in London) and that the Oxford sample was less acidic than the London one, possibly a result of underheated storage conditions.

A coordinated microfilm project involves the British Library, the libraries of Oxford University, Cambridge University and Trinity College, Dublin, as well as the National Libraries of Scotland and Wales. The project is supported by grants from the Mellon Foundation and administered by the National Preservation Office. Microfilming began at the six depository libraries in 1989. Now any library in the U.K. and Ireland can apply for a matching grant to preserve material that is of national importance, dates from between 1830 and 1900, and is printed on paper that is brittle or at risk. Projects must meet technical specifications for film, deposit a master negative in central storage, contribute records for inclusion in the *National Register of Preservation Microforms* and make adequate provision for access for users, including loan and duplication of microfilm. Examples of materials accepted for filming include fiction, trade journals, pamphlets, popular periodicals, folklore and city directories.

The Bodleian Library itself is concentrating on preserving collections of modern manuscripts and trade journals from the late 19th and early 20th centuries. Much effort has to be expended on searching a wide variety of sources to be sure of avoiding duplicate filming of the trade journals. The manuscript collections are unique, however, and do not require searching.

Netherlands

The problem of decaying books in Dutch libraries came to national attention in 1990 through the results of a survey of a large number of Dutch collections conducted by the Advisory Council for Libraries and Archives (RABIN). It found that at least three million books in these collections are in such poor condition that they will be lost if no action is taken; some of them are already beyond rescue. Dutch libraries hold a total of about 70 million volumes, and the RABIN survey probably underestimates the proportion of threatened material. Books published before 1800 suffer from damaged covers and bindings, whereas decaying acid paper is much greater and more serious in post-1800 publications. The difficulties involved in conserving paper are paralleled by those related to preserving audiovisual media and providing access to them, especially

in large corpora such as the Netherlands Film Museum, and the film and videotapes of the Netherlands Broadcasting Production Units. Furthermore, not only do the media themselves age, but the equipment needed to use them becomes antiquated as well. The condition of many of the storage areas in libraries leaves much to be desired. The inevitable conclusion is that the problem is enormous, structural in nature, and requires both national and international approaches. It is difficult to estimate the long-term cost of preservation but approximately 100 million guilders ($50 million) will have to be made available in the short term.

The recommendations of RABIN outline a national policy for the conservation of library material whose goal is to locate, record and conserve at least one copy of every printed or audiovisual item pertinent to the Netherlands. It would include items produced in the Kingdom itself, works produced by Dutch nationals abroad, and works of foreign origin on subjects directly relevant to the Netherlands.

Criteria for deciding what should be saved must be based on the interests of society and scholarship, and scholars must become more widely involved in the decisions. If the "80/20 rule" applies (80 percent of the requested information derives from 20 percent of the collection), it does suggest that not all information warrants heroic efforts to preserve it. In the exact and the social sciences, much of what was published in the 19th century has been incorporated in more recent publications. In the humanities, the problems are more complex. Historians tend to want to preserve everything, and for specialists in art and literature the physical form of the object can play an important role.

Selection criteria would ensure that one copy of all relevant Dutch material is preserved. The actual selection could be implemented by committees composed of librarians and archivists, technical experts, scientists and scholars. It is very important to have scholarly users involved and to use their (probably) conflicting views constructively. In addition, the plan envisions a central registry of preserved materials, central storage and restoration, mechanisms for coordinating preservation actions and subsidies for special collections.

Discussion of the European Experience

The extent of deterioration in European collections may not be quite as great as reported from surveys of U.S. libraries, but there is considerable uncertainty about some of the results from some collection sur-

veys because of recognizable defects in methodology. Germany and Switzerland have about the same proportion of deterioration as the U.S., while Sweden and England report lower rates. In some countries, particularly Italy and Spain, the extent of the problem has not been well assessed.

International cooperation is important. One possibility is for each country to take responsibility for conserving the publications that have appeared within its own borders. If every country would do this, the result would be an international collection of relevant national publications. But an international policy ought to be more than simply the sum of national policies. Certainly, national bodies should play a major role, but international associations of scholars must be involved.

There was general agreement that most users of libraries as well as many librarians are not aware of the extent and seriousness of book deterioration. Especially puzzling and troublesome is the unawareness (and sometimes unconcern) of scholars themselves. It is uncertain whether this condition is due to scholarly parochialism, to the changing attitudes of younger scholars toward old books and early references, or to scholars' belief that "someone will provide" for their information resource needs — libraries, for example. Even active attempts to raise scholarly awareness in the United States through the efforts of professional associations or scholarly societies have met with disappointing results This apparent lack of concern provokes the question: If scholars are not taking active responsibility, how can we expect the general public or the government to support efforts to save knowledge? Scholars, it was pointed out, are ordinarily very narrowly focused on a sub-specialty or a specific topic and become aware of the need for preservation only when they come upon an instance of deterioration in the portion of the collection that they use.

There was not complete agreement about the necessity or desirability of involving scholars actively in the selection process. Official archives, it was said, cannot select in the way scholars might wish. Archives are "the memory of government" and record retention is made by the producers, not the scholars, according to predetermined schedules. Counter-arguments to this opinion remarked that government archives were only one kind of archive and perhaps did have special problems; but who should determine schedules of retention, even in government archives? Should not historians be given a voice in the matter? They have made useful contributions in cases where retention schedules had to be worked out without a precedent — as was true of

some scientific laboratory archives. Cooperation between archivists and scholars will generally be rewarding.

Other voices stressed the importance of involving scholars in selection decisions; even if they have difficulty agreeing their advice can be useful. Scholars should take the longer historical view and alleviate concern about present trends in influencing selection. Every library is itself a result of a long series of choices, many of which reflect the idiosyncratic judgments of scholars that do not agree with those of other scholars.

In any case, it is the responsibility of scholars to develop an informed interest in the preservation of the intellectual heritage and to "carry the message of preservation into the chambers of power."

The portions of the academic community that have a broader view of university resources are the administrative heads such as rectors, presidents, chancellors, chairmen and their immediate associates — those who have responsibility for the larger environment of scholarship. Currently this stratum is oblivious to the problem, but can be alerted through professional associations and articles written especially for them.

Some optimism about raising awareness is warranted. For example, a newspaper preservation project in Sweden had strong public support because of the wide interest in the material. Genealogists and family historians have been very supportive of archival preservation in England. Archives, it was argued, are different from library collections and may need to be approached differently. Archives contain unique, non-duplicated material in non-standard formats, have a more complex informational structure than books and are not susceptible to bibliographic control and demand more complex retrieval systems. Mass deacidification may be the best approach to archival preservation. Still, deacidified material still would exist in only one (and perhaps a quite fragile) copy so that its use might have to be severely limited — or else be copied in order to satisfy wider demand.

The matter of access is significant. One of the most important factors in obtaining funds for preservation from the U.S. Congress is the promise of wider availability of preserved material — the greatest use for the greatest number of people. This concept of "democratization of access" runs counter to often-cherished exclusivity of special collections, whose caretakers may be so interested in having a unique possession as

to endanger its survival because of inadequate resources and technology for stabilization. Even then, the usefulness of such conserved collections is compromised by the fragility of the deacidified paper.

The urgency of preservation in the face of massive, irreversible and already advanced decay of library collections is unquestioned, and debates over appropriate technology should not distract attention from the necessity to act. Collaboration among countries is a necessity, though every country should recognize its responsibility for its own heritage and should strengthen its own internal efforts first.

Exploring Emergent Issues

The reviews of European and U.S. experience with preservation brought forth both commonalities and differences and raised issues that warranted further exploration, three in particular: the seeming lack of awareness of preservation problems on the part of library users; the appropriate role for scholars to play in preservation; and the procurement of needed resources. The discussion of these three issues developed some further common ground.

■ **Increasing Awareness –** In Europe and North America there must be a concerted effort to bring preservation problems to the attention of library users — scholars in particular, but others among the public at large who may have occasion to use books from the endangered era. The prime need is for a vivid statement of the general case for preservation — a statement that can be adapted to various national, regional, professional and popular audiences. The statement should contain examples of "shocking losses," and must make clear that concern with preservation is not just the preoccupation of librarians, archivists or a narrow group of savants. It would be particularly useful to have a film like *Slow Fires*[1] made for European contexts and distributed by educational television.

In addition, national and pan-European groups must be organized to undertake both advocacy and education. This process should begin as soon as possible in order to exploit the sense of purpose that has coalesced during this conference. One possibility is to create a

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[1] *Slow Fires: On the Preservation of the Human Record* is a documentary on the deterioration of books and other scholarly materials that is threatening the libraries and archives of the world. Cooperatively funded by private and public agencies in the U.S., the film was shown extensively on public television when it was first issued in 1987. It is distributed in both U.S. and European video formats by the American Film Foundation, Santa Monica, CA.

European commission on preservation and access with strong national subgroups or correspondents. Such a transnational group would probably need the auspices of an existing international body to serve as its "roof" in the beginning. That choice requires further exploration.

The new preservation groups should direct their advocacy and educational activities to a variety of audiences: international cultural organizations, associations of university administrators, parliamentary commissions, ministerial offices, publishers, groups of librarians and archivists, professional societies and the general public. It is imperative that the message be put persuasively before the public at large since only widespread support will produce governmental action. As far as possible, advocacy and education should be both personal and specific, as well as reaching out through professional journals or newsletters, professional meetings, university newspapers, and, especially for the public at large, the mass media: newspapers, educational television, and magazines of general culture.

Because the structure of print repositories, educational institutions and cultural ministries varies markedly from country to country, the new preservation groups will need to develop a variety of strategies. The experience and judgment of preservation experts in each country (or region) will always be needed to discover where and how to work most effectively within particular structures.

■ **Scholars' Role** – Scholars, and other library users as well, must share with librarians and other custodians the difficult decisions about what is to be given priority in preservation. For the purposes of such collaboration, it is essential to break the habits that separate library users from library keepers. It will also be important to penetrate the boundaries between traditional academic disciplines and between conventional library classifications.

Scholars and other library users must also become informed advocates for the cause of preservation. Scholars can be particularly effective within educational institutions and in dealing with governmental agencies. They must do whatever can be done to inform and motivate their colleagues and students.

■ **Procuring Resources** – Since the task of preservation is so vast, more resources are needed than can probably be obtained. Hence, the question becomes: what resources can be made available and how can they be most intelligently allocated? Although funds should be sought from

private donors, foundations and corporations, only governmental agencies can command resources sufficient to support large-scale and long-lasting preservation programs. Non-governmental sources are more likely to support preliminary organization or narrowly focused projects than continuing operations of preservation programs. If the national or transnational groups are to be effective, there must be a reliable source of funds for staff, however small, as well as for operations.

Ensuing discussions explored these points further. The participants confirmed the primary necessity to raise scholars' and librarians' awareness of the deteriorating books problem, the need to collect "shocking case" examples of lost European materials and to prepare a pan-European "statement of the need to act." The conferees explored ways of developing a professional network of librarians, archivists and scholars, with slightly different approaches being proposed for various countries. An essential feature of such a network would be a small core of individuals — one from each country — who fully understood the problem and were willing to take responsibility. Existing professional networks could be tapped for amplifying the initial group.

Yet the need for some central focus and leadership reasserted itself frequently, and the need for funders, governments and other organizations to have one focal point kept coming to the fore. The discussion touched upon the desirability of simultaneously establishing national organizations and linking them for common efforts. The possible usefulness of existing international organizations was extensively explored. The advantages of non-governmental sponsorship were weighed against the need for large resources and public institutional collaboration.

Gradually the discussion shifted from the concept of a professional network to an organizational structure, and there began to be mention of a hypothetical organization — a "European Commission on Preservation and Access." Since the array of suggestions for constituting such an organization included both complementary and contradictory ideas, a subcommittee of conferees — seven persons in all — was appointed to sort out the alternatives and to present a coherent plan to the plenary session.

Following the adoption of the resolution and recommendations in the next section, the participants held further discussions and elected Drenth, Jouve and Martin to form the *ad hoc* committee. Alison de Puymège agreed to act as the secretariat.

III. RESOLUTION AND RECOMMENDATIONS OF THE CONFERENCE

The following resolution and recommendations were adopted unanimously during the conference.

RESOLUTION

The members of the Conference, having reviewed and discussed the studies undertaken by the [U.S.] Commission [on Preservation and Access] to assess the nature and extent of the threat posed to the world's accumulated knowledge by the rapid decay of acidic paper, and to test this effect and potential of the remedies available,

Affirm and endorse the work of the Commission in that behalf, and commend the sense of urgency with which the Commission is seeking to advance international means to minimize loss, and to promote more effective means of storage, conservation and preservation, to insure access in the future.

The Conference accordingly urges that a European counterpart be established, and, to that end a working group be appointed to explore the possibility of engaging support from European and international organizations.

RECOMMENDATIONS

1) The European conferees at Bellagio should select from among themselves a chair and two members of an *ad hoc* steering committee that will supervise the process of constituting a European commission on preservation and access. The final commission should be an independent body that is endorsed by a wide range of existing cultural institutions and that is perhaps materially supported by two or three of them in the early stages of its development. In its final form, it should also include some representation from the U.S. Commission.

a) The steering committee should invite three other interested and influential persons, not present at Bellagio, to join it. This should be done by July 20, 1993.

b) The augmented steering committee of six should then canvass all participants at Bellagio for nominations to the board of the European commission. These nominations will be reviewed

by the steering committee, which will then elect a board of not more than 15 members. This election should take place by October 15, 1993. Once the board has been elected, it should meet to decide both how best to proceed with the formal and legal establishment of a European commission and how to conduct its own business in the future. The steering committee will be dissolved with that first meeting of the board.

c) While it is soliciting nominations for the board, the steering committee should draft a strong statement of the case for the work of preservation in general and of a European commission in particular.

d) It is expected that the steering committee will have some modest administrative expenses, for which it should seek financial support from the U.S. Commission on Preservation and Access.

2) The board should move expeditiously to establish itself as a legal entity and to appoint and secure financial support for the staff necessary to accomplish its purposes.

3) All of the European conferees should find ways to carry what has been accomplished at Bellagio back to their home countries and home institutions. They should involve a wide range of colleagues in the work of preservation and should take whatever steps they can to publicize and to advocate that work.

APPENDIX

PARTICIPANTS

Birgit Antonsson took up her present post as Director of the Royal Library, National Library of Sweden in 1988. She received a Ph.D. in literary history from Uppsala University in 1972, and subsequently graduated from the Swedish Library College in 1974. After working at Linkoping and Uppsala University Libraries, she became Library Director at the Stockholm School of Economics in 1985, and Deputy Librarian at the Royal Library in 1987. She was President of the Swedish Association of University and Research Libraries from 1984-1986. She is currently Chair of the Swedish Council for Research in the Humanities and Social Sciences. Her most recent publications are ***The Mission Statement of the Royal Library-National Library of Sweden***; ***Till det okatalogiserade tryckets lov eller De dödas encyklopedi i Kungliga biblioteket (Festskrift till Bendik Rugaas)***; and "Introduction" to Bang, H. ***Släkten utan hopp***.

Patricia Battin is the first President of the Commission on Preservation and Access. Before establishing the Commission in 1987, she was Vice-President for Information Services/University Librarian at Columbia University, where she came after serving in various capacities at the library of the State University of New York at Binghamton. A graduate of Swarthmore College in English literature, she also has a library science degree from Syracuse and honorary Doctor of Humane Letters degrees from Lehigh University, where she is also a trustee, and from Emory University. She has been on the board of directors of the Research Libraries Group, the Association of Research Libraries and the Council on Library Resources. She has served on library advisory committees for Harvard, Yale, Lehigh and Syracuse. Her most recent publications are "Redefining Preservation and Reconceptualizing Information Services" in ***Library Issues***; "Bibliographic Control and Access to Microforms" in ***European Research Libraries Cooperation: The LIBER Quarterly***; "The Preservation of Knowledge: Strategies for a Global Society" in ***Strengthening the U.S.-Japan Library Partnership***.

Richard Brilliant is Professor of Art History and Archaeology at Columbia University, where he also holds a named chair in the humanities. Before coming to Columbia, he taught at the University of Pennsylvania, and has been a visiting professor at the University of Pittsburgh, Princeton University, the University of Rome, and the Scuola Normale Superiore, Pisa. At present he is also Editor-in-Chief of ***The Art Bulletin***. Trained as a classical art historian, he has always been interested in theoretical questions, beginning with his first book, ***Gesture and Rank in Roman Art***, an analysis of political imagery and the semiotics of repre-

sentation. His two most recent books, *Visual Narrative* and *Portraiture*, examine the particularities of narrative in visual art, and the nature of portraiture in relation to changing concepts of identity.

Paul Canart is Director of the Manuscripts Department of the Vatican Apostolic Library, and a teacher in its Library School as well as its School of Paleography. His early education in classical philology, Thomistic philosophy and theology was followed by a Docteur ès Lettres awarded by Paris-Sorbonne in 1979. His Vatican career began as a manuscript conservator in 1957 and he has held several other posts in the Library in the interim. President of the Committee for Byzantine Studies of the Holy See, and member of its Committee on Historical Sciences, he is also active in international groups concerned with Byzantine Studies and Greek Paleography. His publications include *Les Vaticani Graeci 1487-1962: Notes et Documents pour l'Histoire d'un Fonds de Manuscrits de la Bibliothèque Vaticane; Paleografia e Codicologia Greca: Una Rassegna Bibliografica; and Codices Vaticani Graeci: Codices 1745-1962.*

Pieter J. D. Drenth is Professor of Psychometrics and Organizational Psychology at Vrije Universiteit in Amsterdam, where he has also served as Rector Magnificus. He received his Ph.D. in psychology from Vrije Universiteit in 1960 and studied at New York University on a Fulbright Scholarship in 1960-61. He was awarded an honorary doctor degree by Ghent University in 1980. He is also currently President of the Royal Netherlands Academy of Arts and Sciences. His principal fields of interest are intelligence theory, personality assessment, leadership and decision making, and cross cultural psychology. His publications include *Advances in Organizational Psychology*, which he edited in 1988.

George F. Farr, Jr. is Director of the Division of Preservation and Access at the National Endowment for the Humanities (NEH), an independent grant-making agency of the United States government. Awards from this division encompass a broad range of preservation and access activities at non-federal institutions, including a national program to preserve on microfilm the intellectual content of approximately 3,000,000 brittle books in 20 years. He holds a Ph.D. in English literature from Yale University and is a member of the Senior Executive Service. Before coming to NEH, he held appointments in the English departments of the University of California, Berkeley, and Vassar College, where he taught courses in Victorian Literature and British fiction. At NEH, he has established grant programs that fund the creation of research tools and reference works, databases in the humanities, scholarly editions and translations, and the coordinated preservation of United States newspapers on

a state-by-state basis. He has written and spoken on a variety of issues pertaining to preservation and the Endowment's work; his most recent article, on the history of NEH's brittle books program, appeared in *Advances in Preservation and Access*, Volume I, 1992.

Colette Flesch is Director-General of Directorate X of the Commission of the European Communities. This Directorate has responsibility for Audiovisual, Information, Communication, and Culture. Born in Luxembourg, she was educated in the United States at Wellesley College and the Fletcher School of Law and Diplomacy, where she received the M.A. and M.A.L.D. Before assuming her current position, she was a European civil servant, then entered Luxembourg political life. Between 1969 and 1990 she was successively: Mayor of Luxembourg, Minister of Foreign Affairs, Minister of the Economy, and Minister of Justice, as well as a member of the European Parliament. Her publications include *La Diplomatie Luxembourgeoise* and *The Luxembourg Chamber of Deputies*.

Christoph Graf is Director of the Swiss Federal Archives and a professor at the Universities of Basel and Berne. His Dr. Phil. is from the University of Berne in 1983 in political history. He is currently a member of the Swiss Federal Committee for Scientific Information. He has been a scholarly collaborator in research projects of the Swiss National Fund and an active member of the General Society of Historical Research of Switzerland, the Society of Swiss Archivists and the International Council on Archives. His publications include *Der Reichstagsbrand* and *Politische Polizei zwischen Demokratie und Diktatur*, as well as contributions to historical and archivist specialty periodicals.

John Heilbron is Vice-Chancellor, University of California, Berkeley, where he is also professor of history and Director of the Office for History of Science and Technology. His Ph.D. in history was granted by Berkeley. Earlier he taught at Cornell University and at the University of Pennsylvania. His principal scholarly interest is the history of physics. He has written on the theory of atomic structure, on electricity in the 17th and 18th centuries, and on early modern physics. The life and work of H. G. J. Mosely, an English physicist, is the subject of one of his books, and he has also written *The Dilemmas of an Upright Man: Max Planck as Spokesman for German Science*. He has studied Nobel awardees and the productivity of academic establishments. He is a foreign member of the Royal Swedish Academy of Sciences. His most recent publications are *The Lawrence Berkeley Laboratory from Its Origins to World War II* and *Benjamin Franklin's Briefe von der Electrizität*.

Mark D. Jordan is Associate Professor at the University of Notre Dame, Indiana, where he is Secretary of the Joint Program in Medieval Philosophy at the Medieval Institute. His Ph.D. in philosophy was awarded by the University of Texas, Austin. He has also taught at the University of Dallas and at the Pontifical Institute of Medieval Studies at Toronto, and spent a year as a Fulbright Scholar at the Universidad de Granada. He is currently a member of the Committee on Library Preservation of the Medieval Academy of America. He has published many articles on Thomistic philosophy, as well as two monographs: *Ordering Wisdom: The Hierarchy of Philosophical Discourses in Aquinas*; and *The Care of Souls and the Rhetoric of Moral Theology in Bonaventure and Aquinas*. He is currently participating as an editor in the project to convert Migne's *Patrologia Latina* to a machine-readable database.

Michel Roger Jouve is Professor of English and Anglo-Saxon Language and Literature at the University of Bordeaux III, as well as its Vice-President and Director of its Center for British Studies and Research. His Doctorat ès Lettres (in English Literature) was awarded by Paris-Sorbonne in 1979. He has taught in London and Le Havre as well as at the Universities of Rouen and Tunis, and participated in instruction by radio and television. His principal research interests are the interpretation of visual art, especially caricature, and aesthetic theories of the arts in Great Britain and Europe from the 18th to the 20th century. His publications include *L'Age d'Or de la Caricature Anglaise*, and "Nation et Nations dans la caricature politique anglaise au 18ème siècle" in *History of European Ideas*.

Stanley Katz is President of the American Council of Learned Societies (ACLS), New York. Born in Chicago, he was educated at Harvard University where he took a Ph.D. in American history as well as a year of legal training. His principal scholarly interest has been in American legal history, especially colonial law and constitutionalism. Before assuming the presidency of ACLS he was Professor of the History of American Law and Liberty at Princeton University. He has also been a member of the faculties of Harvard and the Universities of Chicago, Wisconsin and Pennsylvania. He has served on many advisory and governing boards for universities, foundations and governments. He is a Fellow of the American Antiquarian Society and the American Academy of Arts and Sciences. Recent publications include "Bernard Bailyn, Historian and Teacher" in *The Transformation of Early American History*; "I rapporti culturali fra Europa e Stati Uniti dopo la Seconda guerra mondiale" in *il Mulino*; and "The Strange Birth and Unlikely History of Constitutional Equality" in *The Journal of American History*.

Knut Kleve is Professor of Classics at the University of Oslo. He received his Dr. Phil. from the University of Oslo in 1963. He was Professor of Classics at the University of Bergen from 1963 to 1973 when he joined the faculty at Oslo. A papyrologist who has published extensively on the papyri of Herculaneum, he served as a board member of the Centro Internazionale per lo Studio dei Papiri Ercolanesi as well as head of the research laboratory in the Officina dei Papiri Ercolanesi of the Biblioteca Nazionale, Naples. He is head of the restoration work in the papyrus collection of the University Library in Oslo. His most recent publications are *An Approach to the Latin Papyri from Herculaneum*; "Three technical guides to the papyri of Herculaneum: how to unroll, how to remove sovrapposti, how to take pictures" in *Cronache Ercolanesi*; and "Phoenix from the Ashes: Lucretius and Ennius in Herculaneum" in *The Norwegian Institute at Athens*.

M. Stuart Lynn is Vice-President for Information Technologies at Cornell University. He has an M.A. in mathematics from Oxford University and an M.A. and Ph.D. in mathematics from UCLA. He has held a variety of academic, government, and industrial positions, including Professor of Mathematical Sciences and Director of the Institute for Computer Services and Applications at Rice University; Director of Computing Affairs and Professor of Electrical Engineering and Computer Science at the University of California, Berkeley; and President and Chairman of Capital Technologies Corporation (USA). He is currently a member of the Technology Assessment Advisory Committee of the Commission on Preservation and Access and the Committee on Electronic Publishing of the Coalition for Networked Information. His publications include, through the Commission: *Joint Study in Digital Preservation, Phase 1* (contributing author); *Computerization Project of the Archivo General de Indias, Seville, Spain* (with Hans Rütimann); and *Preservation and Access Technology. The Relationship Between Digital and Other Media Conversion Processes: A Structured Glossary of Technical Terms*.

Vittorio Marchis is Professor of Theoretical and Applied Mechanics at the Politecnico di Turino and also Professor of History of Technology at the University's Architecture Faculty. He is a member of the Engineering and Architecture Committee of the National Research Council (CNR), the Scientific Culture and Historical Scientific Culture Committee of the University and Research Ministry (MURST), and several scientific associations in the fields of mechanics and the history of technology. He is Director of the Politecnico Bulletin of Information and Culture (Linee). His publications include two books on computer modelling of mechanical and engineering systems, *Modelli di Sistemi Termodinamici* and *Modelli*, and several books on the history of engineering and technical culture, among them, *Bibliotheca Technologica*.

Geoffrey Martin is Research Professor at the University of Essex and Senior Research Fellow of Merton College, Oxford. His Dr. Phil. is from Oxford, and he has taught history at the Universities of Leicester and Toronto. He has held the post of Keeper of Public Records for the U.K. and has been a member of the Royal Commission on Historical Monuments and Chairman of the British Records Association. Awarded the CBE in 1986, he has also been honored by a medal of the Library Association and an honorary degree from the University of Essex. His current research interests include medieval guilds and the history of Merton College. Among his recent publications are *Dublin Merchant Guild Rolls, 1190-1265*; *Ipswich Recognizance Rolls, 1294-1327*, and contributions to various learned journals.

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